

REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-15 are currently pending. No claims have been amended herewith.

In the outstanding Office Action, Claims 1-3, 5, 6, and 8-15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,224,167 to Taniguchi et al. (hereinafter “the ‘167 patent”) in view of U.S. Patent No. 5,166,686 to Sugiyama (hereinafter “the ‘686 patent”); Claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘167 patent in view of the ‘686 patent and U.S. Patent No. 6,263,312 to Kolesnik et al. (hereinafter “the ‘312 patent”); and Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘167 patent in view of the ‘686 patent and the Admitted Prior Art (hereinafter “the Background Art”).

Claim 1 is directed to a coding device for coding an input signal, said coding device dividing the input signal into temporally continuous frames each including a predetermined number of discrete temporal samples, the coding device comprising: (1) a dividing unit configured to divide each of the frames into one or more blocks, said dividing unit dividing each of the frames using a plurality of block combinations; (2) a coding unit configured to code each of the blocks at a plurality of bit rates and generate a plurality of block code sequences; and (3) a determination unit configured to select a frame code sequence corresponding to one of the block combinations so that the selected frame code sequence has optimum quality and that an average bit rate for coding the corresponding block combination is not higher than a predetermined bit rate, said determination unit selecting the frame code sequence by determining the block lengths of the respective blocks in the corresponding block combination and determining the bit rates for coding the respective blocks in the corresponding block combination.

Regarding the rejection of Claim 1 under 35 U.S.C. § 103(a), the outstanding Office Action asserts that the ‘167 patent discloses all of the limitations of Claim 1, except a dividing unit configured to divide each of the frames into one or more blocks, said dividing unit dividing each of the frames using a plurality of block combinations. The Office Action, however, cites the ‘686 patent for such a teaching.

The ‘167 patent is directed to a speech coding apparatus using multimode coding. In particular, the ‘167 patent discloses a plurality of coders, which respectively code an input speech signal at different bit rates per frame.¹

However, it is respectfully submitted that the ‘167 patent fails to disclose a “coding unit” configured to code each of the blocks at a plurality of bit rates and generate a plurality of block code sequences, as recited in Claim 1. Rather, the ‘167 patent discloses coders for coding an input speech signal for every frame of the input speech signal, to generate coded speech signals having mutually different bit rates.² The ‘167 patent does not disclose that the coders are configured to code each of the blocks at a plurality of bit rates and to generate a plurality of block code sequences.

Further, it is respectfully submitted that the ‘167 patent fails to disclose the determination unit recited in Claim 1. The Office Action cites Figure 2 (the evaluation unit 4, the comparison/decision unit 5, and the related text) and column 6, lines 40-44 of the ‘167 patent, for such a teaching. However, the ‘167 patent discloses that the evaluation unit 4 receives the reproduced speech signals generated and output by the decoders 2₁-2_m and the input speech signal, and generates evaluation functions of qualities of the reproduced speech signals, which have no transmission errors. Further, the ‘167 patent discloses that the comparison/decision unit 5 selects, on the basis of the evaluation functions and the calculated distortion amount, one error correcting decoder from among the error correcting coders 3₂-3_m,

¹ See ‘167 patent, column 5, lines 9-12.

² Id. at column 2, lines 57-60.

which provides the speech signal having the smallest distortion. Then, the '167 patent discloses that a selector 6 selects the coded speech signal generated and output by the coder specified by the comparison/decision unit 5.³ Further, column 6, lines 40-44 of the '167 patent only discloses that the decoder at the receiver side operates in accordance with the coder identification number k, which is transmitted from the transmitter side.

The '167 patent does not disclose a determination unit configured to select a frame code sequence corresponding to one of the block combinations so that the selected frame code sequence has optimum quality and that an average bit rate for coding the corresponding block combination is not higher than a predetermined bit rate, said determination unit selecting the frame code sequence by determining the block lengths of the respective blocks in the corresponding block combination and determining the bit rates for coding the respective blocks in the corresponding block combination.

Further, it is respectfully submitted that the '686 patent does not cure the deficiencies of the '167 patent, as discussed above. In addition, the outstanding Office Action does not cite the '686 patent as disclosing these features. The Office Action, however, does note that the '686 patent, at column 2, lines 30-33, discloses attaching a signal indicating the optimum block length. However, the '686 patent only discloses that coded symbols of the optimum block length are multiplexed with a signal indicating the optimum block length into a channel for purposes of either transmission or recording.⁴ The '686 patent, does not disclose that the optimum block length is used by a "determination unit," as recited in Claim 1.

Thus, no matter how the teachings of the '167 and '686 patents are combined, the combination does not teach or suggest a coding unit configured to code each of the blocks at a plurality of bit rates and generate a plurality of block code sequences; and a determination unit configured to select a frame code sequence corresponding to one of the block

³ See '167 patent, column 5, lines 20-48.

⁴ Id. at column 2, lines 30-33.

combinations so that the selected frame code sequence has optimum quality and that an average bit rate for coding the corresponding block combination is not higher than a predetermined bit rate, said determination unit selecting the frame code sequence by determining the block lengths of the respective blocks in the corresponding block combination and determining the bit rates for coding the respective blocks in the corresponding block combination.

Accordingly, Applicants respectfully traverse the rejection of Claim 1 (and all associated dependent Claims) as being unpatentable over the '167 and '686 patents.

Claim 10 is directed to a decoding device for decoding an input code sequence obtained by coding an input signal, said input signal being divided into temporally continuous frames each including a predetermined number of discrete temporal samples, and each of the frames being divided into one or more blocks for coding, the decoding device comprising: (1) an information extracting unit configured to extract data of block lengths of the respective blocks, and data of bit rates for coding the respective blocks from the input code sequence; and (2) a decoding unit configured to decode the input code sequence according to the extracted data of the block lengths and the data of the bit rates.

Regarding the rejection of Claim 10 under 35 U.S.C. § 103(a), the outstanding Office Action asserts that the '167 patent discloses all of the limitations of Claim 10, except a dividing unit configured to divide each of the frames into one or more blocks, said dividing unit dividing each of the frames using a plurality of block combinations. The Office Action, however, cites the '686 patent for such a teaching.

As a preliminary matter, it is noted that Claim 10 does not recite a "dividing unit," as asserted by the Office Action. Rather, the Office Action appears to rely on the '686 patent to disclose each of the frames being divided into one or more blocks for coding.

The ‘167 patent, as discussed above, is directed to a speech coding apparatus using multimode coding. The Office Action cites Figure 1 (the speech decoder 20, the error correcting decoder 30, and the related text) of the ‘167 patent as disclosing the “information extracting unit” and the “decoding unit” of Claim 10.

However, with respect to Figure 1, the ‘167 patent discloses that the demultiplexer 16 of the receiver receives a multiplexed transmission signal via a transmission channel, and restores the residual signal, the LPC parameters, and the error correcting codes. The ‘167 patent further discloses that the error correcting decoder 30 receives these signals and outputs an error-corrected residual signal and error-corrected LPC parameters. The speech decoder 20 of the ‘167 patent includes a predictor 121 and an error detector 122, and outputs a reproduced speech signal from the error-corrected residual signal and the error-corrected LPC parameters.⁵

The ‘167 patent does not disclose an information extracting unit configured to extract data of block lengths of the respective blocks, and data of bit rates for coding the respective blocks from the input code sequence; and a decoding unit configured to decode the input code sequence according to the extracted data of the block lengths and the data of the bit rates.

Further, it is respectfully submitted that the ‘686 patent does not cure the deficiencies of the ‘167 patent, as discussed above. In addition, the outstanding Office Action does not cite the ‘686 patent as disclosing these features.

Thus, no matter how the teachings of the ‘167 and ‘686 patents are combined, the combination does not teach or suggest an information extracting unit configured to extract data of block lengths of the respective blocks, and data of bit rates for coding the respective blocks from the input code sequence; and a decoding unit configured to decode the input

⁵ See ‘167 patent, column 2, lines 5-14.

code sequence according to the extracted data of the block lengths and the data of the bit rates.

Accordingly, Applicants respectfully traverse the rejection of Claim 10 (and all associated dependent Claims) as being unpatentable over the '167 and '686 patents.

Regarding the rejection of dependent Claim 4 under 35 U.S.C. §103(a), it is respectfully submitted that the '312 patent fails to remedy the deficiencies of the '167 and '686 patents, as discussed above. Accordingly, it is respectfully submitted that dependent Claim 4 patentably defines over any proper combination of the '167, '686, and '312 patents.

Regarding the rejection of dependent Claim 7 under 35 U.S.C. §103(a), it is respectfully submitted that the '312 patent and the Background Art fail to remedy the deficiencies of the '167 and '686 patents, as discussed above. Accordingly, it is respectfully submitted that dependent Claim 7 patentably defines over any proper combination of the '167 patent, the '686 patent, the '312 patent, and the Background Art.

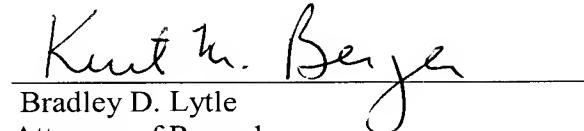
Claims 13 and 15 recite limitations analogous to the limitations recited in independent Claims 1 and 10, respectively. Accordingly, for reasons analogous to the reasons stated above for the patentability of Claims 1 and 10, Applicants respectfully traverse the rejection of Claims 13 and 15 (and dependent Claim 14) as being unpatentable over the '167 and '686 patents.

Thus, it is respectfully submitted that independent Claims 1, 10, 13, and 15 (and all associated dependent claims) patentably define over any proper combination of the '167 patent, the '686 patent, the '312 patent, and the Background Art.

Consequently, in view of the present amendment and in light of the above discussion, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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